

WHAT IS CLAIMED IS:

1. A CDMA base station apparatus comprising a baseband signal processing unit performing baseband signal processing and a plurality of RF signal processing units each performing RF signal processing;
wherein said baseband signal processing unit and said plurality of
5 RF signal processing units are connected by cables transmitting a digital signal bidirectionally;
said baseband signal processing unit multiplexes at least one signal of a CPU-to-CPU communication signal, a frame timing signal, frame number, and a reference clock with a baseband signal, for
10 transmission to each of said plurality of RF signal processing units; and
said plurality of RF signal processing units each multiplexes at least one signal of the frame timing signal and the CPU-to-CPU communication signal with a demodulated digital signal, for transmission to said baseband signal processing unit.
2. The CDMA base station apparatus according to claim 1, wherein said baseband signal processing unit comprises:
a baseband signal processing section performing baseband processing on digital data for downward transmission and baseband
5 processing on digital data for upward transmission;
a channelization coding processing section performing channelization coding on digital data for downward transmission, generated by said baseband signal processing section;
a scramble coding processing section performing scramble coding
10 on digital data which has undergone channelization coding by said

channelization coding processing section;

a CPU-to-CPU communication serial controller generating the CPU-to-CPU communication signal for performing CPU-to-CPU serial communication with respective CPUs of said plurality of RF signal processing units;

15 a frame timing generating section generating the frame timing signal;

a frame number generating section generating the frame number;

a multiplexing section multiplexing a digital signal scramble coded by said scramble coding processing section, the frame timing signal generated by said frame timing generating section, the frame number generated by said frame number generating section, and the CPU-to-CPU communication signal input from said CPU-to-CPU communication serial controller, for format conversion;

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25 an IPDL timing generating section generating a timing of switching on/off a data signal to an arbitrary RF signal processing unit among said plurality of RF signal processing units at an arbitrary chip timing;

IPDL on/off sections each performing on/off control over the digital signal multiplexed and format converted by said multiplexing section for an arbitrary segment on a chip basis based on the timing generated by said IPDL timing generating section;

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35 high-speed digital signal coding sections each performing coding processing on the multiplexed digital signal input from one of said IPDL on/off sections;

parallel-to-serial converting sections each performing parallel-to-serial conversion on a digital signal coded by one of said high-speed digital signal coding sections, thereby converting the digital signal into a high-speed differential digital signal, for output to said each of said 40 plurality of RF signal processing units;

serial-to-parallel converting sections each converting a serial signal input from said each of said plurality of RF signal processing units into a parallel digital signal;

high-speed digital signal decoding sections each for performing 45 decoding processing on the received parallel digital signal converted by one of said serial-to-parallel converting sections; and

a separating section separating the received digital signal decoded by one of said high-speed digital signal decoding sections into a demodulated received digital signal and a CPU-to-CPU communication 50 signal.

3. The CDMA base station apparatus according to claim 2, wherein said cables comprise optical cables; and

said baseband signal processing unit further comprises:

electrical-to-optical signal converting sections each converting a 5 digital signal parallel-to-serial converted by one of said parallel-to-serial converting sections into an optical signal, for outputting to said each of said plurality of RF signal processing units through one of said optical cables; and

optical-to-electrical signal converting sections each converting 10 the high-speed differential digital signal input from said each of the

plurality of RF signal processing units through said one of said optical cables into an electrical signal, for outputting to one of said serial-to-parallel converting sections.

4. The CDMA base station apparatus according to claim 1, wherein said each of said plurality of RF signal processing units comprises:

a serial-to-parallel converting section performing parallel conversion on a high-speed differential digital signal input from said 5 baseband signal processing unit through one of said cables, thereby converting the high-speed differential digital signal into a parallel digital signal;

10 a clock extracting section extracting the reference clock from a parallel digital signal parallel-converted by said serial-to-parallel converting section;

a high-speed digital signal decoding section performing decoding processing on the parallel digital signal parallel-converted by said serial-to-parallel converting section;

15 a separating section separating a digital signal decoded by said high-speed digital signal decoding section into a scramble coded digital signal and the CPU-to-CPU communication signal;

a modulating section modulating the scramble coded digital signal separated by said separating section, for outputting to an RF unit for performing transmission to each of mobile stations;

20 a frame timing extracting section extracting frame timing from the CPU-to-CPU communication signal separated by said separating section;

a frame number extracting section extracting the frame number from the CPU-to-CPU communication signal separated by said
25 separating section;

a CPU-to-CPU communication serial controller generating the CPU-to-CPU communication signal for performing CPU-to-CPU serial communication with a CPU of said baseband signal processing unit;

a demodulating section demodulating a received signal input from
30 said RF unit;

a multiplexing section format-converting a digital signal demodulated by said demodulating section, the CPU-to-CPU communication signal input from said CPU-to-CPU communication serial controller, and the frame timing signal input from said frame
35 timing extracting section;

a high-speed digital signal coding section performing coding processing on a demodulated digital signal format converted by said multiplexing section; and

a parallel-to-serial converting section performing serial conversion on a digital signal format converted by said high-speed digital signal coding section, thereby converting the digital signal into the high-speed differential digital signal, for outputting onto said one of said cables.

5. The CDMA base station apparatus according to claim 4, wherein said cables comprise optical cables; and

said each of said plurality of RF signal processing units further comprises:

5 an electrical-to-optical signal converting section converting the
digital signal parallel-to-serial converted by said parallel-to-serial
converting section into an optical signal, for outputting to said baseband
signal processing unit through one of said optical cables; and

10 an optical-to-electrical signal converting section converting the
high-speed differential digital signal input from said baseband signal
processing unit through said one of said optical cables to an electrical
signal, for outputting to said serial-to-parallel converting section.